

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Withdrawn) A single-fiber passive optical network comprising:
a first interface comprising a first transmitter and a first receiver;
a second interface comprising a second transmitter and a second receiver;
an optical fiber connecting said interfaces; and
a plurality of passive nodes connected in said optical fiber between said interfaces,
wherein in said passive nodes 2-by-2 splitters/combiners are used to couple optical power from
and into said optical fiber at a predetermined split ratio.
2. (Withdrawn) The single-fiber passive optical network according to claim 1,
wherein a plurality of split ratios is used among said passive nodes.
3. (Withdrawn) The single-fiber passive optical network according to claim 2,
wherein said split ratios are configured to provide variable symmetric split ratios among said
passive nodes.
4. (Withdrawn) The single-fiber passive optical network according to claim 1,
wherein the single-fiber passive optical network further comprises:
a detector in said second interface for detecting a degradation in power level of optical
signals received from said first interface via said optical fiber; and in response to detecting,
switching on said second transmitter of said second interface .
5. (Currently Amended) A method of detecting and recovering a failure in a
protected single-fiber passive optical network comprising a first interface including a first
transmitter and a first receiver, a second interface including a second transmitter and a second
receiver, an optical fiber connecting said interfaces, a plurality of passive nodes between said
interfaces, a plurality of optical network units connected to said plurality of passive nodes, the

method comprising the steps of:

sending optical signals from said first interface via said optical fiber to said second interface;

optically detecting at said second interface a degradation in power level of said optical signals from said first interface; and in response to detection,

switching on said second transmitter of said second interface.

6. (Original) The method according to claim 5, wherein:

switching on said second transmitter of said second interface occurs when the power level of said optical signals drops below a predetermined threshold value.

7. (Original) The method according to claim 6, further comprising the step of:

switching off said second transmitter if the power level increases above said predetermined threshold value.

8. (Original) The method according to claim 6, further comprising the step of:

keeping said second transmitter switched on if the power level increases above said predetermined threshold value.

9. (Original) The method according to claim 8, further comprising the step of:

switching said second transmitter off and on again in order to verify that a cable is still broken.

10. (Original) The method according to claim 6, further comprising the step of:

switching off said second transmitter if an abrupt change in the power level is detected after switching on said second transmitter.

11. (Original) The method according to claim 10, further comprising the step of:

switching on said second transmitter again if the power level decreases below said predetermined threshold value.

12. (Original) The method according to claim 5, wherein after detecting the degradation in the power level , and wherein if said first and second interfaces are located in a single optical line terminal, the method further comprises the steps of:

starting, in said second interface, an auto-discovery process to register affected optical network units; and in response to a result of said auto discovery process,
updating an internal routing table of said optical line terminal; and
sending affected downstream traffic of said affected optical network units using said second interface.

13. (Withdrawn) The method according to claim 5, wherein after detecting the degradation in the power level, and wherein if said first and second interfaces are located in different optical line terminals, the method further comprises the steps of:

starting, in said second interface, an auto-discovery process to register affected optical network units;
establishing a dedicated path between said interfaces;
sending a notifying message from said second interface to said first interface, said notifying message comprising information about said affected optical network units;
forwarding downstream traffic of said affected optical network units from said first interface to said second interface via said dedicated path; and
forwarding affected upstream traffic from said affected optical network units from said second interface to said first interface via said dedicated path.

14. (Withdrawn) The method according to claim 13, wherein the method further comprises the step of:

sending from said first interface to said second interface via said dedicated path which higher layer addresses are behind said affected optical network units.

15. (Withdrawn) The method according to claim 14, wherein when receiving an upstream packet via said second interface, the method further comprises the steps of:

checking whether a destination address of the upstream packet is found in a routing table

of an optical line terminal associated with said second interface, and if said destination address is found in said routing table,

sending said upstream packet according to said routing table, and if said destination address is not found in said routing table,

sending said upstream packet from said second interface to said first interface via said dedicated path.

16. (Currently Amended) A method of detecting and recovering from a failure in a protected single-fiber passive optical network comprising a first interface including a first transmitter and a first receiver, a second interface including a second transmitter and a second receiver, an optical fiber connecting said interfaces, a plurality of passive nodes between said interfaces, a plurality of optical network units connected to said plurality of passive nodes, the method comprising the steps of:

detecting in said first interface that signals are not received from at least one optical network unit; and in response to detection,

switching on ~~said second transmitter~~ of said second interface.

17. (Original) The method according to claim 16, wherein the method further comprises the step of:

switching off said second transmitter of said second interface if said first interface detects that a number of optical network units from which signals are not received increases.

18. (Original) The method according to claim 16, wherein if said first and second interfaces are located in a single optical line terminal, the method further comprises the steps of:

starting, at said second interface, an auto-discovery process to register affected optical network units; and in response to a result of said auto discovery process,

updating an internal routing table of said optical line terminal; and

sending affected downstream traffic of said affected optical network units using said second interface.

19. (Withdrawn) The method according to claim 16, wherein if said first and second interfaces are located in different optical line terminals, the method further comprises the steps of:

- establishing a dedicated path between said interfaces;
- sending from said first interface to said second interface a message to switch on said second transmitter of said second interface;
- starting, at said second interface, an auto-discovery process to register affected optical network units;
- sending a notifying message from said second interface to said first interface, said notifying message comprising information about said affected optical network units;
- forwarding affected downstream traffic of said affected optical network units from said first interface to said second interface via said dedicated path; and
- forwarding upstream traffic from said affected optical network units from said second interface to said first interface via said dedicated path.

20. (Withdrawn) The method according to claim 19, wherein the method further comprises the step of:

- sending from said first interface to said second interface via said dedicated path which higher layer addresses are behind said affected optical network units.

21. (Withdrawn) The method according to claim 20, wherein when receiving an upstream packet via said second interface, the method further comprises the steps of:

- checking whether a destination address of the upstream packet is found in a routing table of an optical line terminal associated with said second interface, and if said destination address is found in said routing table,
- sending said upstream packet according to said routing table, and if said destination address is not found in said routing table,
- sending said upstream packet from said second interface to said first interface via said dedicated path.

22. (Currently Amended) A protected single-fiber passive optical network comprising:

- a first interface including a first transmitter and a first receiver;
- a second interface including a second transmitter and a second receiver;
- an optical fiber connecting said interfaces;
- a plurality of passive nodes between said interfaces;
- a plurality of optical network units connected to said plurality of passive nodes;
- a detector at said second interface for optically detecting a degradation in power level of optical signals received from said first interface via said optical fiber; and in response to detecting, said second interface is configured to switch on said second transmitter.

23. (Original) The protected single-fiber passive optical network according to claim 22, wherein said second interface is configured to switch on said second transmitter of said second interface when the optical power level of optical signals received with said second receiver drops below a predetermined threshold value.

24. (Original) The protected single-fiber passive optical network according to claim 23, wherein said second interface is configured to switch off said second transmitter if the power level increases above said predetermined threshold value.

25. (Original) The protected single-fiber passive optical network according to claim 23, wherein said second interface is configured to keep said second transmitter switched on if the power level increases above said predetermined threshold value.

26. (Original) The protected single-fiber passive optical network according to claim 25, wherein said second interface is configured to switch said second transmitter off and again on in order to verify that a cable is still broken.

27. (Original) The protected single-fiber passive optical network according to claim 23, wherein said second interface is configured to switch off said second transmitter if detecting with said detector an abrupt change in the power level after switching on said second transmitter.

28. (Original) The protected single-fiber passive optical network according to claim 27, wherein said second interface is configured to switch on said second transmitter again if the power level decreases below said predetermined threshold value.

29. (Original) The protected single-fiber passive optical network according to claim 22, wherein if said first and second interfaces are located in a single optical line terminal, said second interface comprises:

starting means for starting an auto-discovery process to register affected optical network units; and

updating means for updating an internal routing table of said optical line terminal in response to the result of said auto-discovery process.

30. (Withdrawn) The protected single-fiber passive optical network according to claim 22, wherein if said first and second interfaces are located in different optical line terminals, said second interface comprises:

starting means for starting an auto-discovery process to register affected optical network units;

establishing means for establishing a dedicated path between said interfaces;

sending means for sending a notifying message to said first interface, said notifying message comprising information about said affected optical network units; and

forwarding means for forwarding the affected upstream traffic from said affected optical network units to said first interface via said dedicated path;

said first interface comprises:

forwarding means for forwarding the downstream traffic of said affected optical network units to said second interface via said dedicated path; and

31. (Withdrawn) The protected single-fiber passive optical network according to claim 29, wherein said first interface further includes:

sending means for sending to said second interface via said dedicated path which higher layer addresses are behind said affected optical network units.

32. (Withdrawn) The protected single-fiber passive optical network according to claim 31, wherein said second interface further comprises:

checking means for checking whether a destination address of a received packet is found in a routing table of an optical line terminal comprising said second interface; and sending means for sending said packet according to said routing table if said destination address is found in said routing table, and if said destination address is not found in said routing table, sending said packet from said second interface to said first interface via said dedicated path.

33. (Currently Amended) A protected single-fiber passive optical network comprising:

a first interface including a first transmitter and a first receiver;
a second interface including a second transmitter and a second receiver;
an optical fiber connecting said interfaces;
a plurality of passive nodes between said interfaces;
a plurality of optical network units connected to said plurality of passive nodes;
detecting means for detecting that signals are not received at said first interface from at least one optical network unit; and
sending means for sending to said second interface a message to switch on ~~said second transmitter of~~ said second interface.

34. (Original) The protected single-fiber passive optical network according to claim 33, wherein:

said second interface is configured to switch off said second transmitter of said second interface if said detecting means detects that a number of optical network units from which signals are not received increases.

35. (Original) The protected single-fiber passive optical network according to claim 33, wherein if said first and second interfaces are located in a single optical line terminal, said second interface comprises:

starting means for starting an auto-discovery process to register affected optical network units; and

updating means for updating an internal routing table of said optical line terminal in response to the result of said auto-discovery process.

36. (Withdrawn) The protected single-fiber passive optical network according to claim 33, wherein if said first and second interfaces are located in different optical line terminals:

said first interface comprises establishing means for establishing a dedicated path between said interfaces;

said second interface comprises starting means for starting an auto discovery process to register affected optical network units;

said second interface comprises sending means for sending a notifying message to said first interface, said notifying message comprising information about said affected optical network units;

said first interface comprises forwarding means for forwarding downstream traffic of said affected optical network units to said second interface via said dedicated path; and

said second interface comprises forwarding means for forwarding affected upstream traffic from said affected optical network units to said first interface via said dedicated path.

37. (Withdrawn) The protected single-fiber passive optical network according to claim 36, wherein said first interface further comprises:

sending means for sending to said second interface via said dedicated path which higher layer addresses are behind said affected optical network units.

38. (Withdrawn) The protected single-fiber passive optical network according to claim 37, wherein said second interface further comprises:

checking means for checking whether a destination address of a received packet is found

in a routing table of an optical line terminal associated with said second interface; and

sending means for sending said packet according to said routing table, if said destination address is found in said routing table, and if said destination address is not found in said routing table, said packet from said second interface to said first interface via said dedicated path.

39. (Currently Amended) An interface apparatus ~~or~~ for a protected single-fiber passive optical network, the ~~arrangement~~ apparatus comprising:

a first interface including a first transmitter coupled to a fiber for transmitting optical signals on a first wavelength and a first receiver coupled to said fiber for receiving optical signals on a second wavelength;

a second interface including a second transmitter coupled to said fiber for transmitting optical signals on the second wavelength and a second receiver coupled to said fiber for receiving optical signals on the first wavelength;

detecting means for detecting that optical signals are not received from at least one optical network unit; and

sending means for sending to said second interface a message to switch on ~~said second transmitter of~~ said second interface.

40. (Previously Presented) The interface apparatus according to claim 39, wherein: said second interface is configured to switch off said second transmitter of said second interface if said detecting means detects that a number of optical network units from which signals are not received increases.

41. (Previously Presented) The interface apparatus according to claim 39, wherein if said first and second interfaces are located in a single optical line terminal, said second interface comprises:

starting means for starting an auto-discovery process to register affected optical network units; and

updating means for updating an internal routing table of said optical line terminal in response to a result of said auto-discovery process.

42. (Withdrawn) The interface arrangement according to claim 39, wherein if said first and second interfaces are located in different optical line terminals:

said first interface comprises establishing means for establishing a dedicated path between said interfaces;

said second interface comprises starting means for starting an auto discovery process to register affected optical network units;

said second interface comprises sending means for sending a notifying message to said first interface, said notifying message comprising information about said affected optical network units;

said first interface comprises forwarding means for forwarding downstream traffic of said affected optical network units to said second interface via said dedicated path; and

said second interface comprises forwarding means for forwarding affected upstream traffic from said affected optical network units to said first interface via said dedicated path.

43. (Withdrawn) The interface arrangement according to claim 42, wherein said first interface further comprises:

means for sending to said second interface via said dedicated path which higher layer addresses are behind said affected optical network units.

44. (Withdrawn) The interface arrangement according to claim 43, wherein said second interface comprises:

checking means for checking whether a destination address of a received packet is found in a routing table of an optical line terminal associated with said second interface, if said destination address is found in said routing table;

sending means for sending said packet according to said routing table, and if said destination address is not found in said routing table, for sending said packet from said second interface to said first interface via said dedicated path.

45. (Currently Amended) An interface apparatus for a protected single-fiber passive optical network, the interface ~~arrangement~~ apparatus comprising:

a first interface including a first transmitter coupled to a fiber for transmitting optical signals on a first wavelength and a first receiver coupled to said fiber for receiving optical signals on a second wavelength;

a second interface including a second transmitter coupled to said fiber for transmitting optical signals on the second wavelength and a second receiver coupled to said fiber for receiving optical signals on the first wavelength;

a detector coupled to said fiber for optically detecting a degradation in power level of incoming optical signals of said first wavelength via said fiber; and in response to detecting, said second interface is configured to switch on said second transmitter.

46. (Previously Presented) The interface apparatus according to claim 45, wherein said second interface is configured to switch on said second transmitter when the power level of the received optical signals of said first wavelength drops below a predetermined threshold value.

47. (Previously Presented) The interface apparatus according to claim 46, wherein said second interface is configured to switch off said second transmitter if the power level increases above said predetermined threshold value.

48. (Previously Presented) The interface apparatus according to claim 46, wherein said second interface is configured to keep said second transmitter switched on if the power level increases above said predetermined threshold value.

49. (Previously Presented) The interface apparatus according to claim 48, wherein said second interface is configured to switch said second transmitter off and again on in order to verify that a cable is still broken.

50. (Previously Presented) The interface apparatus according to claim 46, wherein said second interface is configured to switch off said second transmitter if said detector detects an abrupt change in an amount of light after switching on said second transmitter.

51. (Previously Presented) The interface apparatus according to claim 50, wherein said second interface is configured to switch said second transmitter on again if the amount of light decreases below said predetermined threshold value.

52. (Previously Presented) The interface apparatus according to claim 45, wherein if said first and second interfaces are located in a single optical line terminal, said second interface comprises:

starting means for starting an auto-discovery process to register affected optical network units; and

updating means for updating an internal routing table of said optical line terminal in response to a result of said auto-discovery process.

53. (Withdrawn) The interface arrangement according to claim 45, wherein if said first and second interfaces are located in different optical line terminals:

said second interface comprises starting means for starting an auto discovery process to register affected optical network units;

said second interface comprises establishing means for establishing a dedicated path between said interfaces;

said second interface comprises sending means for sending a notifying message to said first interface, said notifying message comprising information about said affected optical network units;

said first interface comprises forwarding means for forwarding downstream traffic of said affected optical network units to said second interface via said dedicated path; and

said second interface comprises forwarding means for forwarding affected upstream traffic from said affected optical network units to said first interface via said dedicated path.

54. (Withdrawn) The interface arrangement according to claim 53, wherein said first interface further comprises:

sending means for sending to said second interface via said dedicated path which higher layer addresses are behind said affected optical network units.

55. (Withdrawn) The interface arrangement according to claim 54, wherein said second interface comprises:

checking means for checking whether a destination address of a received packet is found in a routing table of an optical line terminal associated with said second interface; and

means for sending said packet according to said routing table if said destination address is found in said routing table, and if said destination address is not found in said routing table, for sending said packet from said second interface to said first interface via said dedicated path.